

Serial No. 10/026,811
November 3, 2003
Reply to the Office Action dated June 4, 2003
Page 5 of 8

REMARKS/ARGUMENTS

Claims 16-19 are pending in this application. By this Amendment, Applicant amends the specification, the Title of the Invention and claim 16, and cancels claim 20.

The specification was objected to for containing minor informalities. Applicant has amended the specification and the Title of the Invention to correct the minor informalities noted by the Examiner. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the objection to the specification.

Claim 16-20 were rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. Applicant has amended claim 16 to correct the informality noted by the Examiner. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 16-19 under 35 U.S.C. § 112, second paragraph.

Claim 16 was rejected under 35 U.S.C. § 102(a) as being anticipated by Applicant's Admitted Prior Art (AAPA). In addition, claims 16 and 18-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA. And claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA and Tsuji et al. (U.S. 5,699,027). Applicant respectfully traverses these rejections.

Claim 1 has been amended to recite:

"A method of manufacturing an electronic element, comprising the steps of:

- providing a piezoelectric substrate;
- forming electrode pads on the piezoelectric substrate;
- disposing intermediate electrodes on the electrode pads, said intermediate electrodes including base electrodes located between said electrode pads and said intermediate electrodes;
- forming bump electrodes on the intermediate electrodes;
- disposing the electronic element on a package such that said bump electrodes opposes package electrodes; and
- press-bonding said package electrodes to said bump electrodes while applying ultrasonic waves or heat;

wherein said intermediate electrode is made of at least one of Al and an alloy including Al; and

Serial No. 10/026,811
November 3, 2003
Reply to the Office Action dated June 4, 2003
Page 6 of 8

said base electrodes include a metallic material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrode to greater than about 15 degrees." (Emphasis added)

The present claimed invention in which "said base electrodes include a metallic material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrode to greater than about 15 degrees" effectively prevents the problems of breakage of elements, decreased bond strength between the elements and the package, and breakdown of electrical continuity when the surface acoustic wave element is arranged opposite to the package electrode while applying ultrasonic waves or heat (see, for example, the second full paragraph on page 3 of the specification, as originally filed).

The Examiner alleged that AAPA teaches all of the features recited in the present claimed invention, including "said base electrodes include a metallic material (Titanium, etc.) that reduces orientation of the intermediate electrodes since Ti has a high bonding strength with Al as admitted by Applicant (Page 2, lines 24-27)." Applicant respectfully disagrees.

Claim 16 recites "said base electrodes include a metallic material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrode to greater than about 15 degrees." In contrast, AAPA specifically teaches a base electrode which is made of Ti, which inherently produces a half-width of the locking curve of the X-ray diffraction peak from a (111) plane of Al that is no more than about 15 degrees. AAPA fails to teach or suggest that the base electrode could or should be made of any other material, and certainly fails to teach or suggest that the base electrode could or should be made of a material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrode to greater than about 15 degrees. Since, the half-width of the locking curve produced by a Ti base electrode cannot be greater than about 15

Serial No. 10/026,811
November 3, 2003
Reply to the Office Action dated June 4, 2003
Page 7 of 8

degrees, AAPA clearly fails to teach or suggest "said base electrodes include a metallic material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrode to greater than about 15 degrees" as recited in the present claimed invention.

Furthermore, since AAPA fails to teach or suggest that any other material (other than Ti) could or should be used for the base electrodes, there would have been absolutely no motivation to modify the base electrodes of the surface acoustic wave element of AAPA to be made of a material which increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrode to greater than about 15 degrees as recited in the present claimed invention. The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification. In re Gordon, 221 USPQ 1125 (Fed. Cir. 1984).

Tsuji et al. is relied upon merely to teach a method step of sealing a package airtight, and certainly fails to teach or suggest "said base electrodes include a metallic material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrode to greater than about 15 degrees" as recited in the present claimed invention.

Thus, Applicant respectfully submits that Tsuji et al. fails to cure the deficiencies of AAPA described above.

Accordingly, Applicant respectfully submits that AAPA and Tsuji et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of method steps and features recited in claim 16 of the present application.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claim 16 is allowable. Claims 17-19 depend upon claim 16, and are therefore allowable for at least the reasons that claim 16 is allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt

Serial No. 10/026,811
November 3, 2003
Reply to the Office Action dated June 4, 2003
Page 8 of 8

allowance are solicited.

To the extent necessary, Applicant petitions the Commissioner for a Two-month extension of time, extending to November 4, 2003, the period for response to the Office Action dated June 4, 2003.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

Date: November 3, 2003


Attorneys for Applicant

Joseph R. Keating
Registration No. 37,368

Christopher A. Bennett
Registration No. 46,710

KEATING & BENNETT LLP
10400 Eaton Place, Suite 312
Fairfax, VA 22030
Telephone: (703) 385-5200
Facsimile: (703) 385-5080



10400 Eaton Place
Suite 312
FAIRFAX, VA
Phone: (703) 385-5200
Fax: (703) 385-5080

KEATING & BENNETT LLP**Fax****OFFICIAL****RECEIVED
CENTRAL FAX CENTER****NOV 03 2003****To:** Examiner Nguyen**From:** Christopher A. Bennett**Fax:** 703-872-9302**Date:** November 3, 2003**Phone:****Pages:** 11**Re:** 10/026,811**CC:**

36856.599

•Comments:

Examiner Nguyen,

Please find attached hereto the following documents for the above-identified application:

- 1) Amendment;
- 2) Petition for TWO-Month Extension of time; and
- 3) Credit Card Form PTO-2038 in the amount of \$420.00.

Respectfully submitted,

Christopher A. Bennett
for
Keating & Bennett, LLP
(Registration Number 46,710)